

IN THE CLAIMS:

Please cancel claims 15 – 20, without prejudice.

- 1 1. (Currently Amended) A method of fabricating a membrane electrode assembly
2 for use in a fuel cell, including the steps of:
 - 3 (A) providing a mold that includes a first and second mold plate
4 adapted to impart a desired shape to induce compression;
 - 5 (B) providing a lead frame, including at least a first lead frame compo-
6 nent that is adapted to be received into said mold;
 - 7 (C) assembling a protonically conductive membrane with catalyst coat-
8 ings on each of its major surfaces onto said first lead frame com-
9 ponent;
 - 10 (D) placing said lead frame containing said membrane into the mold;
 - 11 (E) compressing said second mold plate onto said first mold plate;
 - 12 (F) introducing a moldable material in communication with said mold
13 plates;; and
 - 14 (G) allowing the moldable material to cure in said mold to solidify and
15 form a frame around said membrane to produce a membrane elec-
16 trode assembly for use in a fuel cell.
- 1 2. (Original) The method as defined in claim 1 including the further step of integrat-
2 ing a current collector into said first lead frame component onto which said mem-
3 brane is placed.
- 1 3. (Original) The method as defined in claim 2 including the further steps of:
 - 2 (A) providing a second lead frame component that includes a second current
3 collector; and

4 (B) sandwiching said catalyzed membrane between the first and second cur-
5 rent collectors;
6 (C) introducing the lead frame components into said mold;
7 (D) compressing the first and second mold plates together;
8 (E) introducing a moldable material into said mold;
9 (F) allowing the moldable material to cure to form the shape of the mold
10 plates thereby forming a sealed fuel cell.

1 4. (Original) The method as defined in claim 1 wherein the step of introducing the
2 moldable material includes injection molding a moldable material into said mold.

1 5. (Withdrawn) The method as defined in claim 1 wherein the step of introducing
2 the moldable material includes placing said moldable material onto said mold plates and
3 casting a frame around the membrane electrode assembly.

1 6. (Currently Amended) A method of fabricating a fuel cell array, including the
2 steps of:

3 (A) providing a mold that includes a first and second mold plate of a
4 | desired shape that forms a cavity to induce compression;
5 (B) providing a sheet of protonically conductive membrane material
6 | that has been coated on each of its major surfaces with a catalyst material to form
7 | a sheet of catalyzed membrane;
8 (C) providing a lead frame structure that includes a plurality of indi-
9 | vidual lead frame components that define separate fuel cells;
10 (D) assembling said sheet of catalyzed membrane into said lead frame
11 | structure;
12 (E) placing said lead frame structure containing said membrane sheet
13 | into the mold;
14 (F) compressing said second mold plate onto said first mold plate ;

15 (G) introducing a moldable material in communication with said mold
16 plates; and

17 (H) allowing the plastic to cure in said mold to solidify and form a
18 frame around said individual fuel cells to produce a fuel cell array.

7. (Original) A method of establishing a seal around a fuel cell, comprising the steps of:

2 (A)providing a lead frame assembly including:

(i) providing first and second current collectors adapted to serve as lead frame components in an associated mold device;

5 (ii) assembling fuel cell components including:

(a) a catalyzed protonically conductive, electronically non-conductive membrane; and

8 (b) first and second diffusion layers disposed on oppo-
9 site sides of said membrane;

10 (iii) arranging said fuel cell components between said first and
11 second current collectors;

12 (B) inserting the resulting lead frame assembly into a molding device;

13 (C) introducing a moldable material into said molding device; and

14 (D) allowing said moldable material to cure to seal the edges of the
15 lead frame assembly against leaks to thereby seal the fuel cell.

15 lead frame assembly against leaks to thereby seal the fuel cell.

1 8. (Original) The method as defined in claim 7 comprising the further step of spot weld-
2 ing the first and second current collectors that serve as lead frame components together to
3 maintain the components in place.

1 9. (Original) The method as defined in claim 7 including the further step of trimming
2 excess lead frame component portions away from said fuel cell to result in a finished fuel
3 cell.

1 10. (Original) The method as defined in claim 7 including the further step of providing
2 said mold device with a mold cavity which, when said moldable material is introduced
3 into said mold cavity and cured, creates a frame around said fuel cell.

1 11. (Original) A method of establishing a sealed diffusion layer for use in a fuel cell in-
2 cluding the steps of:

- 3 (A) providing a first current collector integrated into a lead frame component;
- 4 (B) applying a diffusion layer material to said first current collector on said
5 lead frame component;
- 6 (C) providing a second current collector integrated into a lead frame compo-
7 nent;
- 8 (D) applying a second diffusion layer material to said second current collector
9 on said lead frame component;
- 10 (E) placing a catalyzed protonically conductive, electronically non-conductive
11 membrane between said first lead frame component and said second lead frame compo-
12 nent to form an assembly;
- 13 (F) placing said assembly into a molding device;
- 14 (G) closing mold plates associated with said molding device and hot pressing
15 the assembly for a predetermined time period;
- 16 (H) introducing a moldable material into said mold cavity of said mold device;
17 and
- 18 (I) allowing said moldable material to cure to seal said lead frame compo-
19 nents integrating said first and second current collectors together to form a fuel cell.

1 12. (Original) The method as defined in claim 11 wherein step (H) includes an insert
2 molding technique.

1 13. (Original) The method as defined in claim 11 including the further step of spot weld-
2 ing said first and second lead frame components together to maintain said components in
3 position prior to placing the assembly into the molding device.

1 14. (Currently Amended) A method of introducing compression into a fuel cell, com-
2 prising the steps of:

3 (A) providing a catalyst coated membrane;

4 (B) providing a first current collector integrated into a first lead frame compo-
5 nent suitable for being received into a molding device;

6 (C) providing a second current collector integrated into a second lead frame
7 component suitable for being received into a molding device;

8 (D) assembling said first and second current collectors on either side of said
9 membrane to result in an assembly;

10 (E) placing said assembly into said mold device that has been provided with
11 |mold plates that form a cavity that induces compression;

12 (F) closing said mold plates and maintaining said mold plates in a closed posi-
13 tion to induce further compression; and

14 (G) introducing a moldable material into the resulting mold cavity thereby cre-
15 ating a frame around the fuel cell that maintains compression within said fuel cell without
16 the need for mechanical fasteners.

1 15. – 20. Cancelled